

*Processes for the Preservation of the Lower Marine Animals.*

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The author particularly describes a new process which he has invented by means of which Siphonophora may be preserved without the separation of a single appendage of the colony from the stem. To obtain good results the following method is to be adopted:—

A solution of sulphate of copper of 15–20 per cent. is made in distilled water (the strength may vary a little according to the species to be operated upon). Then the colony to be fixed is thrown quickly into this solution, and in doing this a considerable quantity of sea-water is at the same time poured in. The solution of sulphate of copper must therefore be of about ten times the volume of the sea-water. When the Siphonophore is fixed (which is effected in a few minutes) some drops of nitric acid are added to the solution, and it is stirred very gently with a glass rod, to prevent the formation of a precipitate.

The Siphonophore is left for four or five hours in this solution, and then hardened before placing it in alcohol. For the latter purpose several hardening reagents may be employed. The best results are obtained by employing Flemming's liquid, composed of 15 parts of chromic acid of 1 per cent., 4 parts of osmic acid of 2 per cent., and 1 part of glacial acetic acid. As it is desirable as much as possible to avoid touching the Siphonophore or changing its vessel before it is completely hardened, the following is the mode of operation:—Part of the solution of sulphate of copper is removed, leaving only sufficient to cover the Siphonophore. Then the Flemming's liquid is gently poured in and left to act for twenty-four hours at least. The volume of this liquid employed must be about double that of the solution of sulphate of copper.

The most important operation in the preservation of these animals is the transfer into alcohol, which must be very slow and gradual. First there are added to the liquid containing the Siphonophore a few drops of alcohol of 25 per cent., introduced by means of a pipette as far as possible from the colony. Then the dose and the concentration of the alcohol are gradually increased. This operation must go on at least for a fortnight before alcohol of 70 per cent. can be employed. The final preservation is made in alcohol of 90 per cent. The results obtained are better in proportion as the transfer into the alcohol has been slow. This rule is a general one in the preservation of all pelagic animals. Chloride and acetate of copper may also be employed; but they do not give such good results.

The solution of sulphate of copper may also be employed with success in fixing a number of pelagic animals, such as certain Ctenophora, Medusæ, Pteropoda, Heteropoda, Tunicata, &c.; but it is always well to harden them after fixation.—*Bibl. Univ., Archives des Sciences Physiques et Naturelles*, June 15, 1889, p. 556.